

Form ESA-B4. Summary Report for ESA-089-2 Public Report - Final

Company	Precoat Metals	ESA Dates	10/9-11/2007
Plant	Granite City, IL	ESA Type	Steam
Product	Steam	ESA Specialist	Ted Kozman

Brief Narrative Summary Report for the Energy Savings Assessment:

Introduction: For this assessment, we ran the SSAT tools for two separate steam systems; one in Granite City, IL with a waste heat boiler (Plant 1) and one in McKeesport, PA with a natural gas boiler Plant 2. The waste heat boiler was somewhat difficult to model (Plant 1) and the cost of natural gas at Plant 2 was very high.

Objective of ESA: To reduce the operating cost of the plants by improving the overall boiler efficiency.

Focus of Assessment: Steam production

Approach for ESA: One day one, we set up the models for both plants, on day two, we looked at all the projects. On day three, we completed the opportunity spread sheet and draft report.

General Observations of Potential Opportunities:

- Indicate total plant natural gas cost for base year, 2006
 - o Plant 1 (waste heat boiler)—effective rate \$3.50/MMBtu—Total Cost \$1,700,000
 - o Plant 2—Effective rate \$10.14/MMBtu--\$2,189,000
- Indicate total plant electrical cost for base year, 2006
 - o Plant 1—6.4 cents/kWh—total = \$425,000/yr
 - o Plant 2—6.06 cents/kWh—total = \$573,102
- Indicate impact fuel cost in \$/MMBtu, impact electrical cost in cents/kWh if necessary for ESA
- Note what you would expect would be Near Term, Medium Term, Long Term opportunities. See definitions below:
 - Near term opportunities would include actions that could be taken as improvements in operating practices, maintenance of equipment or relatively low cost actions or equipment purchases.
 1. Improved condensate recovery (Project 10)—Plant 1--\$7,000/yr savings
 2. Improved insulation (Project 13)—Plant 1--\$11,000/yr savings
 3. Improved condensate recovery (Project 10)—Plant 2--\$1,372/yr savings
 4. Improved Insulation (Project 13)—Plant 2--\$2,632/yr savings
 5. Overall near term savings for both plants--\$22,004/yr

Note: Both plants have good insulation and excellent condensate recovery. However, the plant personnel feel that both can be improved by repairing the faulty traps and fixing the few leaks. For insulation improvement, they feel they can do a better job of insulating valves and replacing insulation that has been damaged.
 - Medium term opportunities would require purchase of additional equipment and/or changes in the system such as addition of recuperative air preheaters and use of energy to substitute current practices of steam use etc. It would be necessary to carryout further engineering and return on investment analysis.
 1. Improve boiler efficiency (Project 3)—Plant 1--\$133,000/yr savings
 2. Reduce boiler blowdown (Project 4)—Plant 1--\$7,000/yr savings
 3. Blowdown flash to steam (Project 9)—Plant 1--\$17,000/yr savings
 4. Improve boiler efficiency (Project 3)—Plant 2--\$30,037/yr savings
 5. Overall medium term savings for both plants--\$187,037/yr

Note: To improve boiler efficiency, an economizer can be added to preheat the boiler feed water prior to entering the boiler and reducing the O₂ content of the stack gasses. While the blowdown rate is within the normal operating range, it can be improved (rate reduced) by continuously monitoring and automatically controlling blowdown.

- ❑ Long term opportunities would require testing of new technology and confirmation of performance of these technologies under the plant operating conditions with economic justification to meet the corporate investment criteria.
 1. Switch fuel for the boiler studied from natural gas to coal, this probably means using a different boiler (Project 2)—Plant 2--\$354,387/yr savings
 2. Blowdown flash to steam (Project 9)—Plant 2--\$3,046/yr savings
 3. Reduce boiler blowdown (Project 4)—Plant 2--\$1,250/yr
 4. Overall Long Term savings for both plants--\$358,683/yr—Plant 2 only
- Estimate, if possible, the identified % plant fuel savings from a) Near Term opportunities; b) Medium Term opportunities, c) Long Term opportunities.
 - Near term—1.0% NG Plant 1, 0.2% NG Plant 2
 - Medium Term—9.0% NG Plant 1, 1.4% NG Plant 2
 - Long Term—0.0% NG Plant 1, 32.1% NG Plant 2
- Estimate, if possible, the identified % electricity savings from a) Near Term opportunities; b) Medium Term opportunities, c) Long Term opportunities.
 - We did not recommend any electricity savings

Management Support and Comments:

Precoat Team Comments:

- 1) The assessment brought to light previously unconsidered options concerning cost savings for boiler system operation.
- 2) The software used for the exercise was straight forward and easy to understand.
- 3) The exercise allowed the team to isolate the boiler operation as a separate and specific entity.
- 4) This exercise allowed the team to quantify boiler improvements and assign dollar value to the improvement costs versus the benefits.
- 5) The exercise also documented the proposed improvements and presented an organized and logical format for communication of priorities, costs and benefits with payback times for the various projects.
- 6) The team recommends the exercise be run for all boiler/steam systems in the company to determine the company-wide benefits.
- 7) The information needed to provide the assessment was readily available at the plant level except for a combustion analysis and steam flow analysis.
- 8) A combustion analysis would need to be completed for each boiler to be assessed.
 - a. Combustion analysis could be performed by an outside service or internally if we rented or purchased an analyzer.
- 9) A steam flow analysis would need to be completed for each boiler to be assessed.
 - a. The steam flow analysis has been performed at Plant 1 by the boiler chemical supplier on a no-charge basis.